California Department of Pesticide Regulation
Environmental Hazards Assessment Program
830 K Street
Sacramento, California 95814

STANDARD OPERATING PROCEDURE

Instructions for the Calibration and Use of a Portable pH meter for Water Sampling Studies

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KEY WORDS-
pH, calibration

APPROVALS

APPROVED BY: _____ DATE: 12/14/98
Management

APPROVED BY: _____ DATE: 12/8/98
EHAP Senior Scientist

APPROVED BY: _____ DATE: 12/11/98
EHAP Quality Assurance Officer

PREPARED BY: Cindy Garretson/Adrian Bradley DATE: 11/10/98

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1.0 INTRODUCTION

1.1 Purpose

Water quality data are often collected when conducting surface water and ground water sampling. pH is often included in the data collected. This document will define the approved method for calibration and use of the portable pH meters used in water sampling studies.

1.2 Scope

This document will provide specific instructions for using a pH meter.

2.0 MATERIALS

2.1 Portable pH meter (accurate to a least 0.1)
2.2 Instruction manual for pH meter
2.3 Extra batteries
2.4 Buffer solutions: 7.0 for a one point calibration, 7.0, 4.0 and 10.0 for a two point calibration
2.5 Small plastic disposable cups
2.6 Deionized (DI) water in a squirt bottle
2.7 Glass jar

3.0 PROCEDURES

3.1 Calibration

3.1.1 At the beginning of each water study stock the pH sampling kit with fresh buffer or buffers and small plastic cups. Check the expiration date to be sure that the buffers will be good for the duration of the study.

3.1.2 Most studies will require a two point calibration. Follow the instructions in the manual for a two point calibration. pH 4 and 7 buffer are used for water that is less than pH 7, and pH 10 and 7 buffers are used for water that has a pH greater than 7. Pour 7 pH buffer into a small plastic cup. **Do not place the pH probe into the stock buffer solutions. Always pour the stock solution into plastic disposable cups**

for calibration. To select the second buffer solution for calibration, use either pH 4 or 10 based on the last recorded pH at the site. If this is the first sample, take a pH reading of a representative sample of the water before calibrating to get a rough approximation. (Note: do not place the probe into a sample designated for analysis. Always use water designated for water quality measurement.) After determining appropriate buffer pH for calibration, rinse the pH electrode with DI water. Immerse the tip of the electrode in 7 buffer. Do a two point calibration using the instruction manual for the specific pH meter. Rinse the electrode between immersion in buffers. Some studies may allow for a one point calibration with pH 7 buffer. Follow instruction manual for the specific pH meter for a one point calibration.

3.2 pH Determination

3.2.1 For surface water measurements, an *in situ* measurement (placing the probe in the river, canal etc.) is preferred. For ground water measurements, collect a sample of water in a new clean glass jar at the same site and at the same time as the ground water is being collected for chemical analysis. For a composite water sample, collect a sub-sample of the composite for pH determination. For water sample collection using an autosampler, take an *in situ* pH measurement and also collect one from the refrigerated composite sample if required by the study protocol. Do not collect pH measurements from a sample designated for chemical analysis or bioassay. Follow protocol instructions for how to collect a sample for pH determination.

3.2.2 Rinse the pH electrode with DI water and gently shake off any excess. Put electrode in the water and wait for the reading to stabilize. Record the pH reading on the chain of custody to the predetermined significant figure, as stated in the study protocol (usually tenth or hundredth).

3.2.3 Rinse the electrode with DI water and replace the cap.

3.2.3 Discard unused solution left in the small plastic cups. Also discard the cups. Use fresh buffer and new cups for each calibration. Rinse the glass jar according to the instructions for washing equipment in SOP FSWA005. Calibration should be maintained between sampling sites if the pH meter is left on and kept in pH 7 or DI water between uses. See manual for exceptions. Store unused buffer in the original container with the pH sampling kit.

3.3 pH Meter Storage

3.3.1 When the field portion of the study is complete, or anytime the pH meter will be out of use for more than a few days, refer to the instructions in the manual for storing the meter.